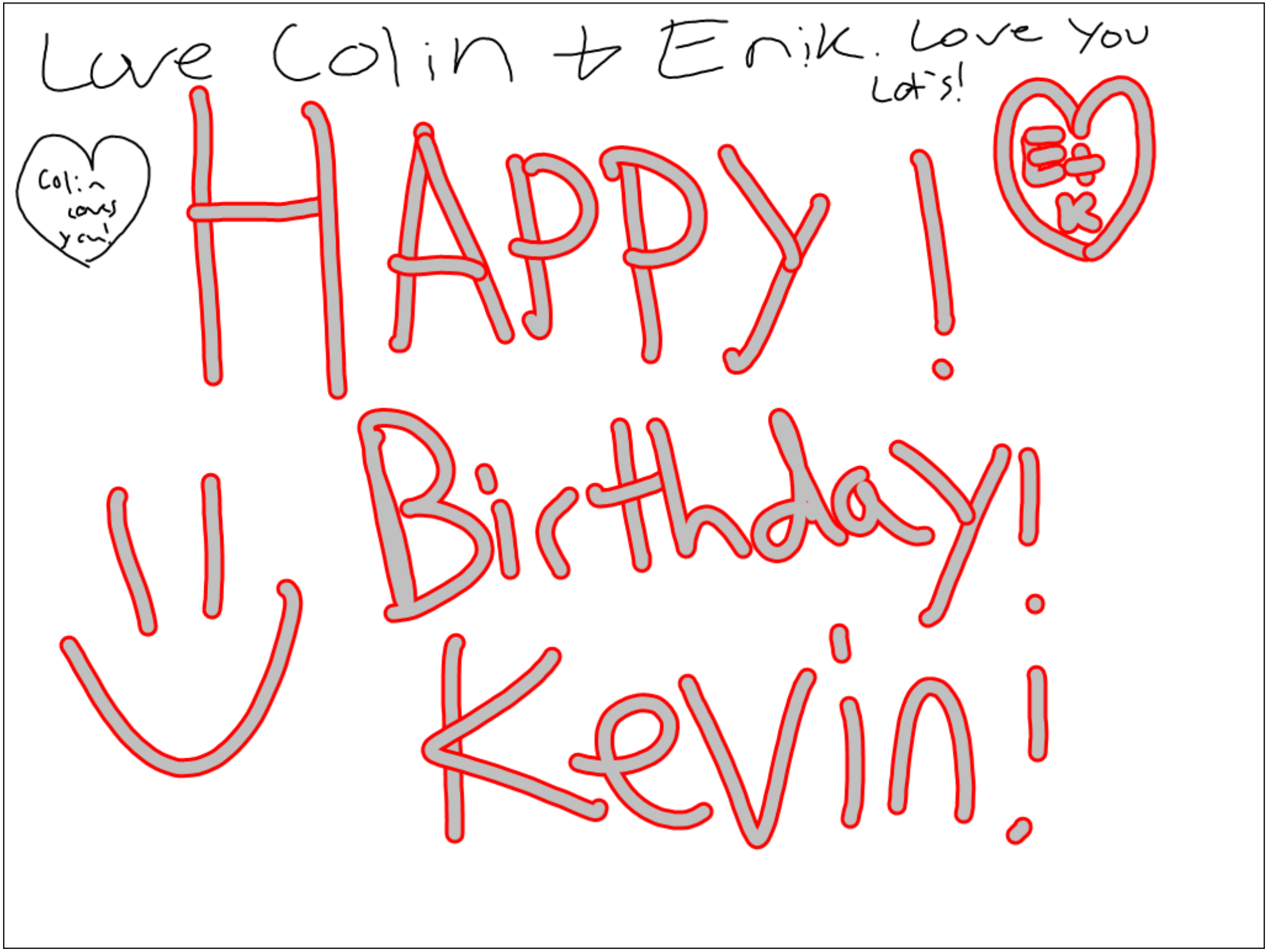
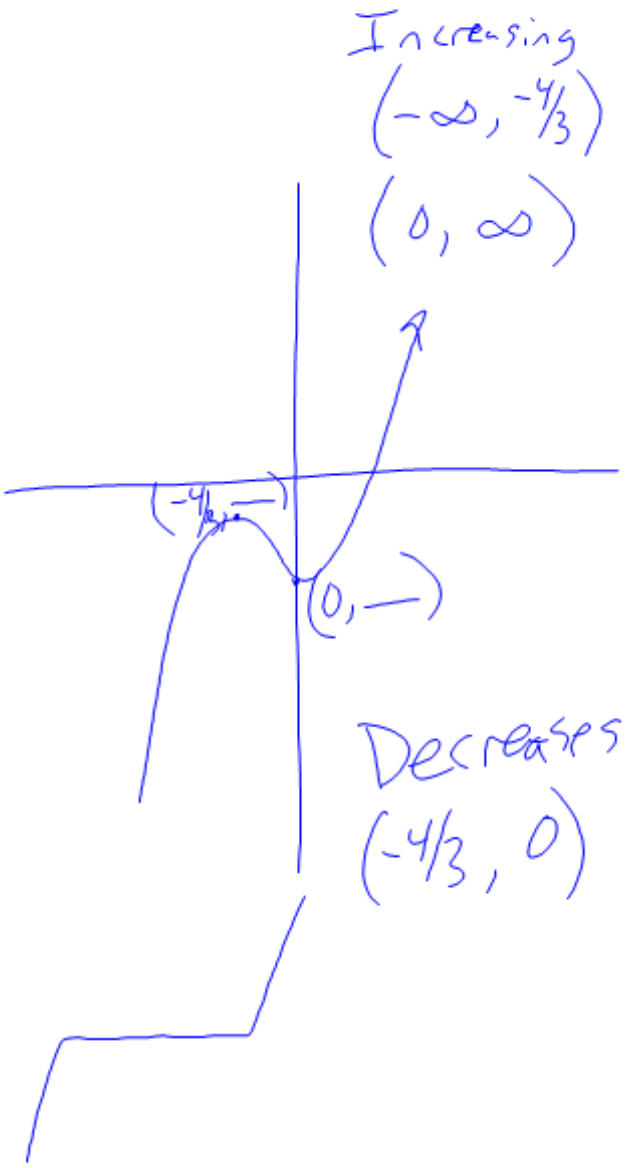

Luve Colin + Erik. Love You Lot's!
Col: ^ Luvs you!
HAPPY !
Erik
U Birthday!
Kevin!

# Sect. 1.3

- Graphs / functions defined p. 30
- vert. line test p. 31

(calc.)
- Increasing/decreasing p. 32
- relative max/min p. 33
- even/odd functions p. 36
- Greatest Integer p. 35
- piecewise p. 35



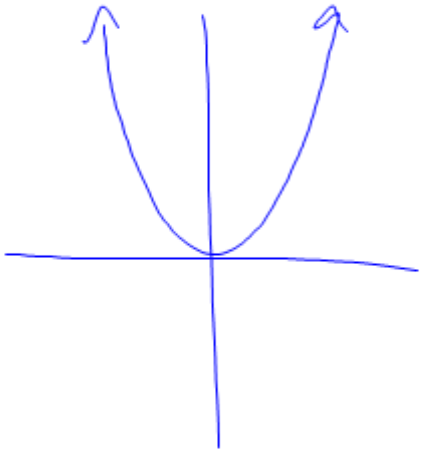
$f(-x) = f(x)$ even $\longrightarrow$ $y = x^2$ (reflects across y-axis)

$f(-x) = -f(x)$ odd $\longrightarrow$ $y = x^3$ (reflects across origin)
reflect across x-axis
y-axis

$f(-2) = -f(2)$
$-4 \quad -4$

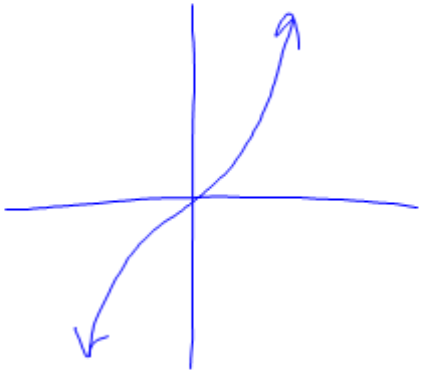
otherwise, neither

$f(x) = x^2$, $f(-2) = 4 = f(2)$ = even



$f(x) = x^3$, $f(-2) = -4$
$f(2) = 4$

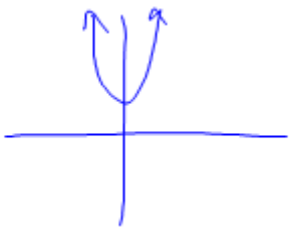
$f(-x)$ if $f(x) = x^3$
$-x^3$



$f(x) = 2x^2 + 1$

$f(2) = 2(2)^2 + 1 \quad f(-2) = 2(-2)^2 + 1$

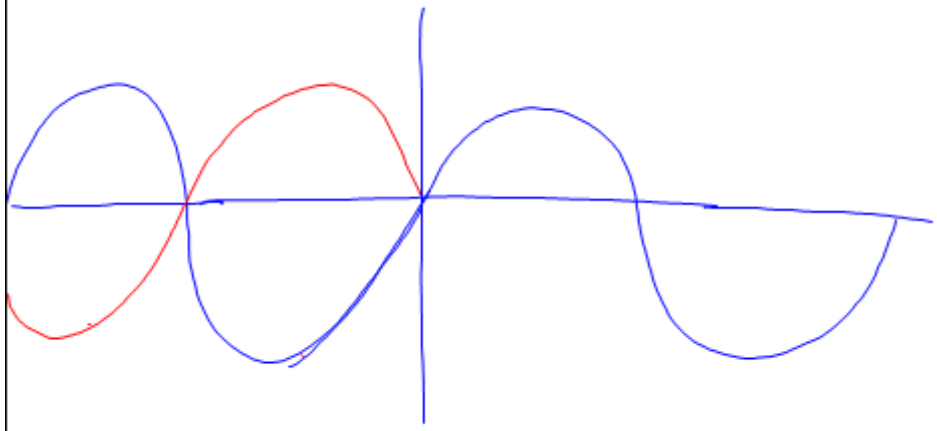
$= 9 \quad$ even $\quad = 9$



$f(x) = 2x^2 + 3x$

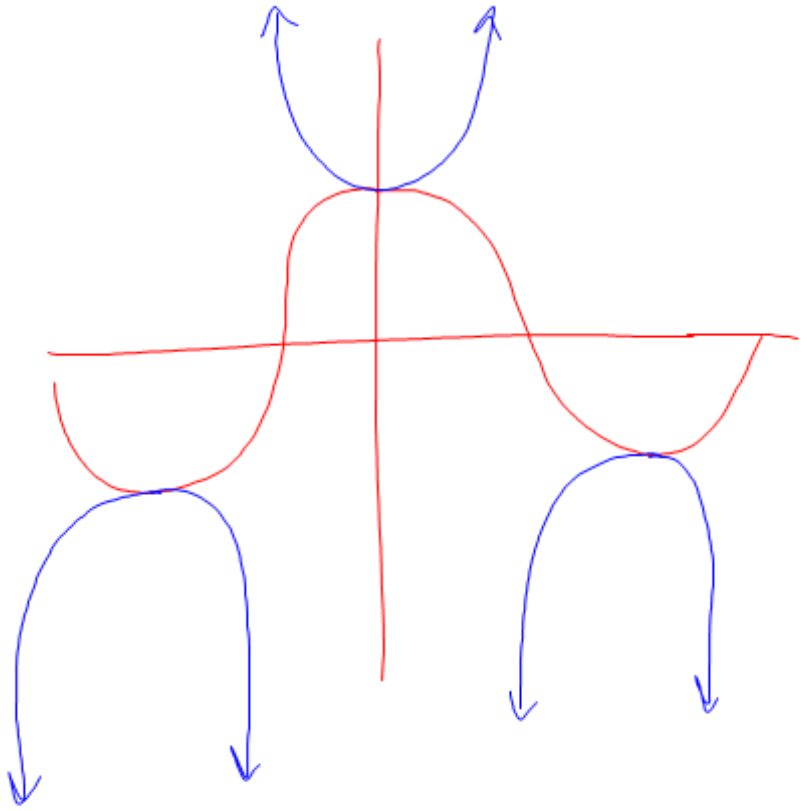
$f(2) = 2(2)^2 + 3(2) \quad f(-2) = 2(-2)^2 + 3(-2)$

$= 14 \quad$ Neither $\quad = 2$



$\sin(-x) = -\sin x$

$\cos(-x) = \cos x$



# Greatest Integer

$f(x) = [[x]]$

$f(-2) = [[-2]] = -2$

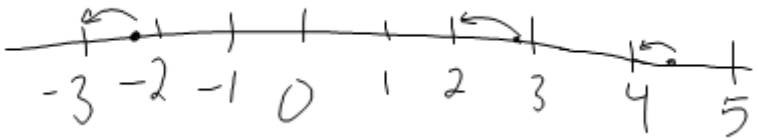
$f(2) = [[2]] = 2$

$f(2.5) = [[2.5]] = 2$

$f(2.9999) = [[2.9999]] = 2$

$f(4.3) = [[4.3]] = 4$

$f(-2.1) = [[-2.1]] = -3$



55

$f(x) = 4x^{2/3}$

$f(8) = 4 \cdot \left(\sqrt[3]{8}\right)^2$

$= 4 \cdot 2^2$

$= 16$

or

$4 \cdot \sqrt[3]{8^2}$

$4 \cdot \sqrt[3]{64}$

$4 \cdot 4$

$= 16$

$f(-x) = 4(-x)^{2/3}$

$f(-8) = 4 \cdot \left(\sqrt[3]{-8}\right)^2$

$= 4 \cdot (-2)^2$

$= 16$

even

$g(x) = 2x + 1$ $\quad f(x) = x^2 - 3$

Composition of functions

Find $g(3)$, $g(-2)$, $f(7)$, $f(-3)$

$g(3) \to 7$ $\quad g(-2) \to -3$ $\quad f(7) \to 46$ $\quad f(-3) \to 6$

$f(g(x)) = (f \circ g)(x)$

$f(g(3)) = 46$

$f(g(-2)) = 6$

Try $(g \circ f)(2) = 3$

$f(2) = (2)^2 - 3$

$= 1$

$g(1) = 2(1) + 1 = 3$

$g(x) = 2x + 1 \qquad f(x) = x^2 - 3$

$(g \circ f)(x) = 2(x^2 - 3) + 1$

$= 2x^2 - 5$

$(g \circ f)(2) = 2(2)^2 - 5$

$= 3$

---

$(f \circ g)(x) = (2x + 1)^2 - 3$

$(2x + 1)(2x + 1) - 3$

$4x^2 + 4x + 1 - 3$

$4x^2 + 4x - 2$

# Combinations of functions

$$(f+g)(x) = f(x) + g(x)$$

$$(f-g)(x) = f(x) - g(x)$$

$$(f \cdot g)(x) = f(x) \cdot g(x)$$

$$\left(\frac{f}{g}\right)(x) = \frac{f(x)}{g(x)}, \quad g(x) \neq 0$$

$g(x) = 2x + 1$

$f(x) = x^2 - 3$

$(f+g)(3) = 3^2 - 3 + 2(3) + 1$

$= 13$

## Sect. 1.5

#2, 5, 45, 63-72(3), 77, 94

## Sect. 1.6

#6, 10, 18, 21-24, 41-52(1-2)